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Research project: "My lab studies the role of epigenetics in the brain development and human disease. In this regard, we use a combination of molecular and cellular biology techniques in primary neural stem cells and brain cell lines. A particular focus in our lab is on the role of DNA methylation, MeCP2 regulatory network, and downstream cell signaling pathways. The available projects in my lab for the next summer are designed to study the role selected FDA-approved drugs in brain-derived neural stem cells and human brain tumor cells. We will study the effect of these drugs on MeCP2 network and its downstream signaling pathways. We have exciting new data in the lab, on certain FDA-approved drugs (with low or no side effects) that control MeCP2 gene regulatory network in the brain. We will aim to characterize the cell signaling pathways that are involved in the effect of these drugs, and elucidate the molecular mechanisms of these effects through epigenetic approaches. The outcome is expected to be important in future therapeutic strategies of MeCP2-associated neurological disorders and brain tumor."

Spencer Gibson, Ph.D., Professor
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Research description: Cancer is a deadly disease that becomes resistant to most treatments. We will investigate innovative mechanism to induce cell death in cancer cells and try to avoid drug resistance in cancer through novel drug combinations. This research is supported by CancerCare Manitoba Foundation.

Meaghan J. Jones, PhD, Assistant Professor
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My primary research interests are in how epigenetics helps cells remember past exposures, and how this cellular memory affects long term health. My current research project looks at how epigenetic marks change in response to prenatal exposure to cigarette smoke, and whether these marks influence development of asthma or allergies. I use a combination of data from human birth cohorts and controlled laboratory exposures using animal and cellular models. Students in my lab have the opportunity to learn laboratory work as well as data analysis and presentation skills.